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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,973	01/16/2004	Richard A. Hogle	M03A445	8329

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THE BOC GROUP, INC.  
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MURRAY HILL, NJ 07974-2064

EXAMINER
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BOYER, RANDY

ART UNIT	PAPER NUMBER
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1797

MAIL DATE	DELIVERY MODE
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10/12/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/759,973

Applicant(s)

HOGLE ET AL.

Examiner

Randy Boyer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☒ Claim(s) 4 and 7-12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :

16 January 2004 and 19 October 2005.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Upon further consideration, Examiner has determined that the search of Applicant's apparatus and method claims are coextensive. Consequently, the previous requirement for restriction is withdrawn and all claims are presently examined.

### ***Claim Objections***

2. Claim 4 is objected to for lack of antecedent basis in the claim.
3. With respect to claim 4, the claim recites the limitation "the aerosol removal component." There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.
4. Claims 9-12 are objected to for improper use of the English language.
5. With respect to claims 9-11, the claims read in relevant part "wherein the catalytic unit is maintain at a temperature . . .". This language is improper because it uses the

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incorrect verb form. Examiner suggests correction by amending the claims to read in relevant part "wherein the catalytic unit is *maintained* at a temperature . . ." (emphasis added). Appropriate correction is required.

6. With respect to claim 12, the claim reads in relevant part "wherein the aerosol removal unit and catalytic unit are position at a distance from a fluorine generator." This language is improper because it uses the incorrect verb form. Examiner suggests correction by amending the claims to read in relevant part "wherein the aerosol removal unit and catalytic unit are *positioned* at a distance from a fluorine generator" (emphasis added). Appropriate correction is required.

7. Claims 7-11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

8. With respect to claims 7-11, the claims recite the limitations "wherein the aerosol removal unit is maintained at a temperature . . .", "wherein the catalytic unit is maintained at a temperature . . .", or "wherein the catalytically activated combustion surface is maintain[ed] at a temperature . . .". Examiner interprets these claims to be *process* claims because they are defining a *process* condition, namely the operating temperature. As such, the *process* limitations of claim 7-11 do not further limit the *apparatus* of claim 1. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, claim 1 recites the broad recitation "an oxygen-containing stream," and the claim also recites "typically air or exhaust gases comprising air" which is the narrower statement of the range/limitation.

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***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tojo (EP 1367149 A1) in view of Hartmann (DE 4136885 C1). Alternatively, claims 1-

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18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tojo (EP 1367149 A1) in view of Hartmann (DE 4136885 C1), as evidenced by Hodgson (US 5378324) or Holt (US 3287171).

16. With respect to claim 1, Tojo discloses an apparatus (see Tojo, Fig. 1) comprising an electrolyte aerosol removal unit (14) comprising an aerosol removal composition (e.g. sodium fluoride or soda lime) (see Tojo, column 7, lines 17-29) therein through which a fluid comprising hydrogen and residual amounts of HF is adapted to flow (see Tojo, column 5, lines 25-27).

Tojo does not disclose wherein the apparatus further comprises a catalytic unit including a catalytically activated combustion surface, the catalytic unit adapted to be positioned inside of a forced convection duct, the catalytic unit fluidly connected to the aerosol removal unit by a conduit, the catalytically activated combustion surface adapted to combust the hydrogen in an oxygen-containing stream; or wherein the apparatus is useful for disposal of hydrogen.

However, Hartmann discloses an apparatus (see Hartmann, Fig. 1) useful for the disposal of hydrogen (see Hartmann, English Abstract) wherein the apparatus comprises a catalytic unit (6) comprising a catalytically activated combustion surface (see Hartmann, column 4, lines 34-43), and wherein the catalytic unit (6) is adapted to be positioned inside of a forced convection duct (20). In addition, Hartmann explains that the apparatus of his invention is preferably used to dispose of hydrogen in hydrogen-containing mixtures such as that generated during an electrolyte process (e.g. hydrogen produced in the fluorine generation process of Tojo) (see Hartmann, column



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1, lines 3-8). Hartmann also notes that his apparatus provides for the safe disposal of hydrogen without the loss of essential process chemicals (see Hartmann, English Abstract; and column 1, lines 40-46).

Therefore, the person having ordinary skill in the art of hydrogen disposal would have been motivated to modify the apparatus of Tojo so as to incorporate the catalytic unit of Hartmann in order to provide a safe and effective means for disposing of the hydrogen generated during the electrolytic fluorine generation process of Tojo.

Finally, the person having ordinary skill in the art of hydrogen disposal would have had a reasonable expectation of success in modifying the apparatus of Tojo as described above because (1) both Tojo and Hartmann disclose apparatuses for carrying out an electrolytic reaction; and (2) Hartmann explicitly discloses the use of his catalytic unit in conjunction with an electrolytic cell (e.g. element 1 of Tojo's Fig. 1) in order to remove excess hydrogen produced as a by-product of electrolyte reactions (e.g. the hydrogen produced during the electrolytic fluorine generation process of Tojo).

17. With respect to claim 2, the apparatus of Tojo appears to be modular (see Tojo, Fig. 1).

18. With respect to claim 3, portability alone is not sufficient to patentability distinguish over a prior art device unless there are new or unexpected results. See MPEP 2144.04(V)(A) (citing *In re Lindberg*, 194 F.2d 732 (CCPA 1952)).

19. With respect to claim 4, Tojo discloses wherein the aerosol removal component fills an adsorption column (e.g. "in bed form") (see Tojo, column 7, lines 17-29).

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20. With respect to claim 5, Tojo discloses wherein the aerosol removal composition is sodium fluoride or soda lime (see Tojo, column 7, lines 17-29).

21. With respect to claim 6, Tojo discloses wherein nickel is a preferred material of construction for the aerosol removal unit and associated equipment, namely because of its anticorrosive properties (see Tojo, column 7, lines 45-50).

22. With respect to claim 7, Tojo is not limited in any way with respect to the operating temperature of his aerosol removal unit. Thus, Examiner finds that the temperature maintained within the aerosol removal unit of Tojo will be in accordance with those typically observed in other (i.e. similar) processes for the electrolytic production of fluorine. In this regard, Examiner notes that Hodgson discloses a process for the electrolytic production of fluorine wherein a process temperature of about 100°C is maintained throughout (see Hodgson, column 4, lines 62-65; and column 5, lines 18-21).

23. With respect to claims 8-11, Hartmann discloses wherein the catalytic unit is operated at a temperature between 50°C and 200°C (see Hartmann, column 4, lines 44-53).

24. With respect to claim 12, Tojo discloses wherein the aerosol removal unit (14) is positioned at a distance from the fluorine generator (1) (see Tojo, Fig. 1). In addition, Hartmann discloses wherein the catalytic unit (6) is positioned at a distance from the electrolytic cell (1) (see Hartmann, Fig. 1).

25. With respect to claim 13, "making integral" of a prior art device is generally held to be a matter of obvious engineering design choice in the absence of new or

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unexpected results. See MPEP 2144.04(V)(B) (citing In re Larson, 340 F.2d 965 (CCPA 1965)).

26. With respect to claims 14 and 15, Hartmann discloses the use of platinum as a catalyst in the catalytic unit (see Hartmann, column 4, lines 34-43). Moreover, Hartmann is not particularly limited as to the form or shape of the catalytically activated combustion surface. In this regard, Examiner notes that Holt discloses the use of platinum and rhenium supported on metal screens as catalysts for oxidation reactions (e.g. the catalytic oxidation reaction carried out in the catalytic unit of Hartmann) (see Holt, column 1, lines 10-18; and column 3, lines 6-18).

27. With respect to claim 17, Tojo discloses wherein the aerosol removal unit (14) is fluidly connected (via outlet port for hydrogen gas (23) and gas line (28)) to a fluorine generator (1) and adapted to accept a hydrogen-rich fluid (via gas line (28)) (see Tojo, Fig. 1).

28. With respect to claim 16, Tojo discloses a method comprising the steps of flowing a fluid comprising hydrogen and residual amounts of HF (via hydrogen gas outlet (23) and gas line (28)) from a fluorine generator (1) through an electrolyte removal component (14) comprising an aerosol removal composition (e.g. sodium fluoride or soda lime) (see Tojo, column 7, lines 17-29), wherein the fluid contacts the aerosol removal composition thereby forming a hydrogen-rich fluid reduced in aerosol (see Tojo, Fig. 1; and column 7, lines 17-29).

Tojo does not disclose wherein the method further comprises the step of

contacting the hydrogen-rich fluid reduced in aerosol with a catalytically activated combustion surface positioned inside of a forced convection duct, while a gas comprising oxygen flows through the forced convection duct, thereby combusting the hydrogen with oxygen in the oxygen-containing stream.

However, Hartmann discloses a method for the disposal of hydrogen (see Hartmann, English Abstract) wherein hydrogen-rich fluid is contacted with a catalytically activated combustion surface positioned inside of a forced convection duct (20), while a gas comprising oxygen flows through the forced convection duct (20), thereby combusting the hydrogen with oxygen in the oxygen-containing stream (see Hartmann, Fig. 1; and column 4, lines 18-64). In addition, Hartmann explains that the method of his invention is preferably used to dispose of hydrogen in hydrogen-containing mixtures such as that generated during an electrolyte process (e.g. hydrogen produced in the fluorine generation process of Tojo) (see Hartmann, column 1, lines 3-8). Hartmann also notes that his method provides for the safe disposal of hydrogen without the loss of essential process chemicals (see Hartmann, English Abstract; and column 1, lines 40-46).

Therefore, the person having ordinary skill in the art of hydrogen disposal would have been motivated to modify the method of Tojo so as to incorporate the catalytic unit of Hartmann in order to provide a safe and effective means for disposing of the hydrogen generated during the electrolytic fluorine generation process of Tojo.

Finally, the person having ordinary skill in the art of hydrogen disposal would have had a reasonable expectation of success in modifying the method of Tojo as

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described above because (1) both Tojo and Hartmann disclose methods for carrying out an electrolytic reaction; and (2) Hartmann explicitly discloses the use of his catalytic unit in conjunction with an electrolytic cell (e.g. element 1 of Tojo's Fig. 1) in order to remove excess hydrogen produced as a by-product of electrolyte reactions (e.g. the hydrogen produced during the electrolytic fluorine generation process of Tojo).

29. With respect to claim 18, Tojo discloses a method for generating fluorine comprising the steps of: (a) generating a fluorine-rich stream (exiting fluorine generator (1) through fluorine gas outlet (22)) and a hydrogen-rich stream (exiting fluorine generator (1) through hydrogen gas outlet (23)), the hydrogen-rich stream comprising minor amounts of electrolyte and hydrogen fluoride (see Tojo, column 7, lines 17-29); and (b) routing the fluorine-rich stream to a cleanup train (e.g. HF absorber (15)) to produce a purified fluorine stream (see Tojo, Fig. 1; and column 7, lines 17-50).

Tojo does not disclose wherein the method further comprises routing the hydrogen-rich stream to an apparatus for the oxidative combustion of the hydrogen.

However, Hartmann discloses a method for the disposal of hydrogen (see Hartmann, English Abstract) wherein hydrogen-rich fluid is contacted with a catalytically activated combustion surface positioned inside of a forced convection duct (20), while a gas comprising oxygen flows through the forced convection duct (20), thereby combusting the hydrogen with oxygen in the oxygen-containing stream (see Hartmann, Fig. 1; and column 4, lines 18-64). In addition, Hartmann explains that the method of his invention is preferably used to dispose of hydrogen in hydrogen-containing mixtures such as that generated during an electrolyte process (e.g. hydrogen produced in the

fluorine generation process of Tojo) (see Hartmann, column 1, lines 3-8). Hartmann also notes that his method provides for the safe disposal of hydrogen without the loss of essential process chemicals (see Hartmann, English Abstract; and column 1, lines 40-46).

Therefore, the person having ordinary skill in the art of hydrogen disposal would have been motivated to modify the method of Tojo so as to incorporate the catalytic combustion unit of Hartmann in order to provide a safe and effective means for disposing of the hydrogen generated during the electrolytic fluorine generation process of Tojo.

Finally, the person having ordinary skill in the art of hydrogen disposal would have had a reasonable expectation of success in modifying the method of Tojo as described above because (1) both Tojo and Hartmann disclose methods for carrying out an electrolytic reaction; and (2) Hartmann explicitly discloses the use of his catalytic unit in conjunction with an electrolytic cell (e.g. element 1 of Tojo's Fig. 1) in order to remove excess hydrogen produced as a by-product of electrolyte reactions (e.g. the hydrogen produced during the electrolytic fluorine generation process of Tojo).

### ***Conclusion***


30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-7113. The examiner can normally be reached Monday through Friday from 10:00 A.M. to 7:00 P.M.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RPB



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